

What is claimed is:

1 1. A resynchronous control apparatus for a subscriber
2 communication machine which communicates with an
3 office communication machine over an existing
4 communication line comprising:

5 an off-synchronous detector for detecting
6 off-synchronization of communication with said office
7 communication machine;

8 a correlation processor for correlatively
9 processing received data received over said
10 communication line and held data having been
11 transmitted from said office communication machine
12 when said off-synchronous detector detects said
13 off-synchronization; and

14 a resynchronous controller for specifying a
15 synchronous timing by said correlation process of said
16 correlation processor to establish resynchronization
17 in communication with said office communication
18 machine.

1 2. The resynchrononous control apparatus for a
2 subscriber communication machine according to claim
3 1, wherein said correlation processor comprises:

4 a signal holder for holding signal data
5 received from said office communication machine in
6 steady communication; and

7 a correlation operator for operating
8 correlation between held data held in said signal
9 holder and received data received after detection of
10 said off-synchronization to detect received data
11 having high correlation with said held data.

1 3. The resynchronous control apparatus for a
2 subscriber communication machine according to claim
3 2, wherein said signal holder holds an average value
4 of received data in a particular time section in said
5 steady communication as said held data.

1 4. The resynchronous control apparatus for a
2 subscriber communication machine according to claim
3 2, wherein said correlation processor comprises:

4 a signal data maximum value holder for holding
5 a maximum value of absolute values of said held data
6 or a value obtained by adding an arbitrary margin value
7 to said maximum value; and

8 a maximum value determination type correlation
9 operation controller for making said correlation
10 operator carry out said correlation operation in only
11 a time section in which absolute values of received
12 data received after said off-synchronization is
13 detected are not larger than a value held in said signal
14 data maximum value holder.

1 5. The resynchronous control apparatus for a
2 subscriber communication machine according to claim
3 2, wherein said correlation processor comprises:

4 a signal data minimum value holder for holding
5 a minimum value, as a first value, of absolute values
6 of said held data or a second value obtained by
7 multiplying a value, which is obtained by adding an
8 arbitrary margin value to said minimum value, by an
9 arbitrary coefficient, and a result of comparison
10 between the first or second value and the absolute value
11 of said held data; and

12 a minimum value determination type correlation
13 operation controller for making said correlation
14 operator carry out said correlation operation in only
15 a time section in which absolute values of received
16 data of whole one symbol received after said
17 off-synchronization is detected are larger than said
18 minimum value or a value obtained by multiplying a value,
19 which is obtained by adding an arbitrary margin value
20 to said minimum value, by an arbitrary coefficient not
21 larger than said coefficient at samples in which the
22 absolute values of said held data are determined to
23 be larger as results of said comparison.

1 6. The resynchronous control apparatus for a
2 subscriber communication machine according to claim
3 2, wherein said correlation processor comprises:

4 a frame boundary detector for detecting a frame
5 boundary of said signal data on the basis of correlation
6 between signal data of a length of a cyclic prefix
7 attached to the head of received data received after
8 off-synchronization is detected and signal data of a
9 length of the cyclic prefix attached to the tail of
10 the same; and

11 a frame boundary detection type correlation
12 operation controller for making said correlation
13 operator carry out said correlation operation on a
14 frame specified by a frame boundary detected by said
15 frame boundary detector.

1 7. The resynchronous control apparatus for a subscriber
2 communication machine according to claim 3, wherein
3 said correlation processor comprises:

4 a signal data maximum value holder for holding
5 a maximum value of absolute values of said held data
6 or a value obtained by adding an arbitrary margin value
7 to said maximum value; and

8 a maximum value determination type correlation
9 operation controller for making said correlation
10 operator carry out said correlation operation in only
11 a time section in which absolute values of received
12 data received after said off-synchronization is
13 detected are not larger than a value held in said signal
14 data maximum value holder.

1 8. The resynchronous control apparatus for a subscriber
2 communication machine according to claim 3, wherein
3 said correlation processor comprises:

4 a signal data minimum value holder for holding
5 a minimum value, as a first value, of absolute values
6 of said held data or a second value obtained by
7 multiplying a value, which is obtained by adding an
8 arbitrary margin value to said minimum value, by an
9 arbitrary coefficient, and a result of comparison
10 between the first or second value and the absolute value
11 of said held data; and

12 a minimum value determination type correlation
13 operation controller for making said correlation
14 operator carry out said correlation operation in only
15 a time section in which absolute values of received
16 data of whole one symbol received after said
17 off-synchronization is detected are larger than said
18 minimum value or a value obtained by multiplying a value,
19 which is obtained by adding an arbitrary margin value
20 to said minimum value, by an arbitrary coefficient not
21 larger than said coefficient at samples in which the
22 absolute values of said held data are determined to
23 be larger as results of said comparison.

1 9. The resynchronous control apparatus for a subscriber
2 communication machine according to claim 3, wherein

3 said correlation processor comprises:
 4 a frame boundary detector for detecting a frame
 5 boundary of said signal data on the basis of correlation
 6 between signal data of a length of a cyclic prefix
 7 attached to the head of received data received after
 8 off-synchronization is detected and signal data of a
 9 length of the cyclic prefix attached to the tail of
 10 the same; and
 11 a frame boundary detection type correlation
 12 operation controller for making said correlation
 13 operator carry out said correlation operation on a
 14 frame specified by a frame boundary detected by said
 15 frame boundary detector.

1 10. The resynchronous control apparatus for a
 2 subscriber communication machine according to claim
 3 1, wherein said subscriber communication machine
 4 comprises an equalizer for adaptively equalizing
 5 received data from said office communication machine
 6 while updating a predetermined equalization
 7 coefficient; and
 8 said resynchronous controller makes said
 9 equalizer not update said equalization coefficient
 10 until said resynchronization is established after said
 11 off-synchronization is detected.

1 11. The resynrhonous control apparatus for a

2 subscriber communication machine according to claim
3 1, wherein said subscriber communication machine
4 comprises a gain amplifier for adaptively amplifying
5 a gain of received data from said office communication
6 machine while updating a predetermined gain
7 coefficient; and

8 said resynchronous controller makes said gain
9 amplifier not update said gain coefficient until said
10 resynchronization is established after said
11 off-synchronization is detected.

1 12. The resynchronous control apparatus for a
2 subscriber communication machine according to claim
3 1, wherein said resynchronous controller stops
4 transmission to said office communication machine
5 until said resynchronization is established when said
6 off-synchronization is detected by said
7 off-synchronization detector.

1 13. A resynchronizing method for a subscriber
2 communication machine which communicates with an
3 office communication machine over an existing
4 communication line comprising the steps of:

5 an off-synchronization detecting step of
6 detecting off-synchronization with said office
7 communication machine;

8 a correlation processing step of correlatively

9 processing received data received over said
10 communication line and held data having been
11 transmitted from said office communication machine
12 when said off-synchronization is detected at said
13 off-synchronization detecting step; and

14 a resynchronization controlling step of
15 specifying a synchronous timing by said correlation
16 process at said correlation processing step to
17 establish resynchronization of the communication with
18 said office communication machine.

1 14. The resynchronizing method for a subscriber
2 communication machine according to claim 13, wherein
3 said correlation processing step comprises the steps
4 of:

5 a signal holding step of holding signal data
6 received from said office communication machine in
7 steady communication; and

8 a correlation operating step of operating
9 correlation between said held data and received data
10 received after said off-synchronization is detected
11 to detect received data having high correlation with
12 said held data.

1 15. The resynchronizing method for a subscriber
2 machine according to claim 14, wherein at said
3 correlation operating step, said correlation

4 operation is carried out in only a time section in which
5 absolute values of received data received from said
6 office communication machine are not larger than a
7 maximum value of absolute values of said held data or
8 a value obtained by adding an arbitrary margin value
9 to said maximum value.

1 16. The resynchronizing method for a subscriber
2 communication machine according to claim 14, wherein
3 at said correlation operating step, a minimum value
4 of absolute values of said held data or a value obtained
5 by multiplying a value, which is obtained by adding
6 an arbitrary margin value to said minimum value, by
7 an arbitrary coefficient is compared with a magnitude
8 of an absolute value of said held data, and said
9 correlation operation is carried out in only a time
10 section in which absolute values of received data of
11 whole one symbol received after said
12 off-synchronization is detected are larger than said
13 minimum value or a value obtained by multiplying a value,
14 which is obtained by adding an arbitrary margin value
15 to said minimum value, by an arbitrary coefficient not
16 larger than said coefficient at samples in which the
17 absolute values of said held data are determined to
18 be larger as results of said comparison.

1 17. The resynchronizing method for a subscriber

2 communication machine according to claim 14, wherein
3 said correlation processing step comprises a frame
4 boundary detecting step of detecting a frame boundary
5 of received data received from said office
6 communication machine on the basis of correlation
7 between signal data of a length of a cyclic prefix at
8 the head of received data received from said office
9 communication machine after said off-synchronization
10 is detected and a signal data of a length of the cyclic
11 prefix at the tail of the same; and

12 at said correlation operating step, said
13 correlation operation is carried out on a frame
14 specified by the frame boundary detected at said frame
15 boundary detecting step.